TORQ Analysis of Machinists to Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic

INPUT SECTION:

Transfer	Title	O*NET	Filters		
From Title:	Machinists	51-4041.00	Abilities:	Importance LeveL: 50	Weight: 1
To Title:	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	51-4034.00	Skills:	Importance LeveL: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

OUTPUT SECTION:

Grand TORQ:	89

Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	88	Level	90	Level	90

Gaps To Narrow if Possible

Ability	Level	Gap	Impt
Finger Dexterity	46	7	62
Reaction Time	44	7	62
Trunk Strength	42	5	50

Upgrade These Skills

Skill	Level	Gap	Impt
Mathematics	66	2	78

Knowledge to Add

Knowledge	Level	Gap	Impt
No Knowledge Upgrades Required!			

LEVEL and IMPT (IMPORTANCE) refer to the Target Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic. GAP refers to level difference between Machinists and Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic.

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Importance
Control Precision	57	51	68
Arm-Hand Steadiness	55	42	65
Finger Dexterity	39	46	62
Reaction Time	37	44	62
Near Vision	57	48	59
Problem Sensitivity	55	46	56
Oral Comprehension	57	46	53
Oral Expression	59	42	53

Selective Attention	48	41	53
Manual Dexterity	55	41	53
Multilimb Coordination	51	44	53
Static Strength	48	42	53
Information Ordering	67	42	50
Trunk Strength	37	42	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Importance
Mathematics	64	66	78
Operation Monitoring	78	63	77
Equipment Selection	74	61	69

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Importance
Mechanical	70	68	72

Experience & Education Comparison

Related Work Experience Comparison

Description	Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
10+ years	0%	3%
8-10 years	0%	1%
6-8 years	2%	0%
4-6 years	46%	29%
2-4 years	4%	21%
1-2 years	16%	18%
6-12 months	1%	7%
3-6 months	1%	7%
1-3 months	1%	0%
0-1 month	0%	1%
None	24%	9%

Required Education Level Comparison

Description	Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
Doctoral	0%	0%
Professional Degree	0%	0%
Post-Masters Cert	0%	0%
Master's Degree	0%	0%
Post-Bachelor Cert	0%	0%
Bachelors	0%	0%
AA or Equiv	14%	1%
Some College	2%	4%
Post-Secondary Certificate	12%	38%
High Scool Diploma or GED	69%	44%
No HSD or GED	1%	3%

Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic
Most Common Educational/Training Requirement:	
Long-term on-the-job training	Moderate-term on-the-job training

Job Zone Comparison	
3 - Job Zone Three: Medium Preparation Needed	3 - Job Zone Three: Medium Preparation Needed
Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.
Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Tasks

Machinists

Core Tasks

Generalized Work Activities:

- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Monitor Processes, Materials, or Surroundings - Monitoring and reviewing information from materials, events, or the environment, to detect or assess problems.

Specific Tasks

Occupation Specific Tasks:

- Advise clients about the materials being used for finished products.
- Align and secure holding fixtures, cutting tools, attachments, accessories, and materials onto machines.
- Calculate dimensions and tolerances using knowledge of mathematics and instruments such as micrometers and vernier calipers.
- Check work pieces to ensure that they are properly lubricated and cooled.
- Clean and lubricate machines, tools, and equipment to remove grease, rust, stains, and foreign matter.
- Confer with engineering, supervisory, and manufacturing personnel to exchange technical information.

Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Core Tasks

Generalized Work Activities:

- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Making Decisions and Solving Problems - Analyzing information and evaluating results to choose the best solution and solve problems.
- Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Specific Tasks

Occupation Specific Tasks:

- Adjust machine controls and change tool settings in order to keep dimensions within specified tolerances.
- Compute unspecified dimensions and machine settings, using knowledge of metal properties and shop mathematics.
- Crank machines through cycles, stopping to adjust tool positions and machine controls to ensure specified timing, clearances, and tolerances.
- Inspect sample workpieces to verify conformance with specifications, using instruments such as gauges, micrometers, and dial indicators.
- Install holding fixtures, cams, gears, and stops to control stock and tool

- Confer with numerical control programmers to check and ensure that new programs or machinery will function properly, and that output will meet specifications.
- Design fixtures, tooling, and experimental parts to meet special engineering needs.
- Dismantle machines or equipment, using hand tools and power tools, to examine parts for defects and replace defective parts where needed.
- Establish work procedures for fabricating new structural products, using a variety of metalworking machines.
- Evaluate experimental procedures, and recommend changes or modifications for improved efficiency and adaptability to setup and production.
- Fit and assemble parts to make or repair machine tools.
- Install experimental parts and assemblies such as hydraulic systems, electrical wiring, lubricants, and batteries into machines and mechanisms.
- Install repaired parts into equipment, or install new equipment.
- Lay out, measure, and mark metal stock to display placement of cuts.
- Machine parts to specifications using machine tools such as lathes, milling machines, shapers, or grinders.
- Maintain industrial machines, applying knowledge of mechanics, shop mathematics, metal properties, layout, and machining procedures.
- Measure, examine, and test completed units to detect defects and ensure conformance to specifications, using precision instruments such as micrometers.
- Monitor the feed and speed of machines during the machining process.
- Observe and listen to operating machines or equipment to diagnose machine malfunctions and to determine need for adjustments or repairs.
- Operate equipment to verify operational efficiency.
- Position and fasten work pieces.
- Prepare working sketches for the illustration of product appearance.
- Program computers and electronic instruments such as numerically controlled machine tools.
- Select the appropriate tools, machines, and materials to be used in preparation of machinery work.
- Set controls to regulate machining, or enter commands to retrieve, input, or edit computerized machine control media.
- Set up and operate metalworking, brazing, heat-treating, welding, and cutting equipment.
- Set up, adjust, and operate all of the movement, using hand tools, power tools, and measuring instruments.
- Lift metal stock or workpieces manually or using hoists, and position and secure them in machines, using fasteners and hand tools.
- Mount attachments, such as relieving or tracing attachments, to perform operations such as duplicating contours of templates or trimming workpieces.
- Move controls to set cutting speeds and depths and feed rates, and to position tools in relation to workpieces.
- Move toolholders manually or by turning handwheels, or engage automatic feeding mechanisms to feed tools to and along workpieces.
- Position, secure, and align cutting tools in toolholders on machines, using hand tools, and verify their positions with measuring instruments.
- Replace worn tools, and sharpen dull cutting tools and dies using bench grinders or cutter-grinding machines.
- Select cutting tools and tooling instructions, according to written specifications or knowledge of metal properties and shop mathematics.
- Start lath or turning machines and observe operations to ensure that specifications are met.
- Study blueprints, layouts or charts, and job orders for information on specifications and tooling instructions, and to determine material requirements and operational sequences.
- Turn valve handles to direct the flow of coolant onto work areas or to coat disks with spinning compounds.

Detailed Tasks

Detailed Work Activities:

- adjust production equipment/machinery setup
- compute production, construction, or installation specifications
- examine products or work to verify conformance to specifications
- install equipment or attachments on machinery or related structures
- lay out machining, welding or precision assembly projects
- load or unload material or workpiece into machinery
- maintain or repair industrial or related equipment/machinery
- monitor production machinery/equipment operation to detect problems
- move or fit heavy objects
- operate hoist, winch, or hydraulic boom
- operate lathes
- operate metal or plastic fabricating

basic machine tools and many specialized or advanced variation tools to perform precision machining operations.

- Study sample parts, blueprints, drawings, and engineering information to determine methods and sequences of operations needed to fabricate products, and determine product dimensions and tolerances.
- Support metalworking projects from planning and fabrication through assembly, inspection, and testing, using knowledge of machine functions, metal properties and mathematics.
- Test experimental models under simulated operating conditions for such purposes as development, standardization, and feasibility of design.

Detailed Tasks

Detailed Work Activities:

- adjust production equipment/machinery setup
- advise clients or customers
- confer with engineering, technical or manufacturing personnel
- design tools or mechanical devices
- determine tasks needed to complete machined products
- examine products or work to verify conformance to specifications
- fabricate, assemble, or disassemble manufactured products by hand
- follow statistical process control procedures
- identify base metals for welding
- install equipment or attachments on machinery or related structures
- lay out machining, welding or precision assembly projects
- load or unload material or workpiece into machinery
- maintain or repair industrial or related equipment/machinery
- maintain welding machines or equipment
- monitor production machinery/equipment operation to detect problems
- move or fit heavy objects
- operate metal or plastic fabricating equipment/machinery
- perform safety inspections in manufacturing or industrial setting
- program computer numerical controlled machines
- read blueprints
- read specifications
- read technical drawings
- recognize characteristics of alloys
- recognize characteristics of metals
- operate metal or plastic fabricating equipment/machinery
- read blueprints
- read production layouts
- read specifications
- read technical drawings
- read work order, instructions, formulas, or processing charts
- recognize characteristics of metals
- set up computer numerical control machines
- set up production equipment or machinery
- understand machine setup instructions
- understand technical operating, service or repair manuals
- use hand or power tools
- use precision measuring tools or equipment

Technology - Examples

- set up and operate variety of machine tools
- set up computer numerical control machines
- set up production equipment or machinery
- solve machine tool problems
- understand machine setup instructions
- understand technical operating, service or repair manuals
- use arc welding equipment
- use drafting or mechanical drawing techniques
- use hand or power tools
- use knowledge of fire suppression methods in industrial emergencies
- use knowledge of metric system
- use machining practices
- use non-destructive test equipment
- use precision measuring tools or equipment
- use robotics systems technology
- use technical information in manufacturing or industrial activities
- use x-ray or magnetic inspection techniques
- weld together metal parts, components, or structures

Technology - Examples

Analytical or scientific software

- Armchair Machinist software
- CNC Consulting Machinists' Calculator
- EditCNC software
- Kentech Kipware Software
- Kentech Trig Kalculator

Computer aided design CAD software

- Autodesk AutoCAD software
- Computer aided design CAD software

Computer aided manufacturing CAM software

- CNC Mastercam
- CNC TurboCAD/CAM
- Computer aided manufacturing CAM software
- JETCAM software

Electronic mail software

- Microsoft Outlook

Facilities management software

- Faster Fleet Management software

Industrial control software

- Pro CNC software

Office suite software

- Microsoft Office

Project management software

- Kentech Kipware PLN
- Kentech Kipware QTE
- Kentech Kipware TRK

Spreadsheet software

- Microsoft Excel

Word processing software

- Microsoft Word

Tools - Examples

- Adjustable wrenches
- Anvils
- Grinding wheel arbors
- Bandsaws
- Grinding dogs
- Milling vises
- Chamfer tools
- Jointers
- Torches
- Boring bars
- Broachers
- Calipers
- Chucks
- Cold chisels
- Combination wrenches
- Deburring tools
- Desktop computers
- Center drills
- Side cutting pliers
- Angled feeler gauges
- Files

- Forklifts
- Marking blocks
- Brazing equipment
- Angle plates
- Shapers
- Crankshaft grinders
- Ball peen hammers
- Clamps
- Gauges
- Hex keys
- Edge finders
- Hydraulic presses
- Ladders
- Laser printers
- Breaker lathes
- Spirit levels
- Channel lock pliers
- Magnetic retrievers
- Microscopes
- Rubber mallets
- Metal inert gas MIG welders
- Prick punches
- Inside micrometers
- 3-axis computerized numerical control CNC machines
- Milling machines
- Needlenose pliers
- Personal computers
- Personal digital assistants PDA
- Pipe wrenches
- Screw pitch gauges
- Planers
- Plasma welders

- Platforms
- Sandblasters
- Buffers
- Chippers
- Combination drills
- Cylindrical grinders
- Sanders
- Cold saws
- Vernier bevel protractors
- Pry bars
- Putty knives
- Ratchet sets
- Reamers
- Resurfacing machines
- Welding lenses
- Hacksaws
- Phillips head screwdrivers
- Scribers
- Cylinder honers
- Metal shears
- Shims
- Machine shop rigging equipment
- Socket sets
- Soldering equipment
- Machinists' squares
- Steel rules
- Swaging equipment
- Taps
- Thread gauges
- Threading machines
- Pipe threaders
- Aviation snips

- Tongs
- Bending machines
- Tungsten inert gas TIG welding equipment
- Radial drills
- Utility knives
- Steel wedges
- Arc welders
- Welding shields
- Metal spray equipment
- Cranes
- Arbor presses

Labor Market Comparison

Description	Machinists	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	Difference
Median Wage	$ 41,560	$ 34,350	$(7,210)
10th Percentile Wage	$ 26,250	$ 24,320	$(1,930)
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	$ 48,290	$ 38,660	$(9,630)
90th Percentile Wage	$ 56,030	$ 43,940	$(12,090)
Mean Wage	$ 41,780	$ 33,810	$(7,970)
Total Employment - 2007	1,860	110	-1,750
Employment Base - 2006	1,832	109	-1,723
Projected Employment - 2016	1,905	99	-1,806
Projected Job Growth - 2006-2016	4.0 %	-9.2 %	-13.2 %
Projected Annual Openings - 2006-2016	35	2	-33

National Job Posting Trends

Trend for Machinists

Trend for Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Data from Indeed

Recommended Programs

Machinist/Machine Technologist

Machine Tool Technology/Machinist. A program that prepares individuals to apply technical knowledge and skills to plan, manufacture, assemble, test, and repair parts, mechanisms, machines, and structures in which materials are cast, formed, shaped, molded, heat treated, cut, twisted, pressed, fused, stamped or worked.

Institution	Address	City	URL
Central Maine Community College	1250 Turner St	Auburn	www.cmcc.edu
Central Maine Community College	1250 Turner St	Auburn	www.cmcc.edu
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Southern Maine Community College	2 Fort Road	South Portland	www.smccME.edu

Machine Shop Assistant

Machine Shop Technology/Assistant. A program that prepares individuals to apply technical knowledge and skills to fabricate and modify metal parts in support of other manufacturing, repair or design activities, or as an independent business.

No schools available for the program

Maine Statewide Promotion Opportunities for Machinists

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings
51-4041.00	Machinists	100	3	1,860	$41,560.00	$0.00	4%	35
51-4111.00	Tool and Die Makers	85	3	160	$51,670.00	$10,110.00	-11%	2
51-4192.00	Lay-Out Workers, Metal and Plastic	82	2	180	$43,870.00	$2,310.00	-24%	3
51-4012.00	Numerical Tool and Process Control Programmers	79	3	60	$43,530.00	$1,970.00	21%	2
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	78	3	440	$49,450.00	$7,890.00	-19%	15
17-3023.01	Electronics Engineering Technicians	76	3	430	$45,180.00	$3,620.00	-20%	9
17-3023.03	Electrical Engineering Technicians	75	3	430	$45,180.00	$3,620.00	-20%	9
49-2095.00	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	75	5	20	$60,790.00	$19,230.00	5%	1
49-9012.00	Control and Valve Installers and Repairers, Except Mechanical Door	74	3	170	$47,860.00	$6,300.00	-9%	3
49-9061.00	Camera and Photographic Equipment Repairers	73	3	0	$44,660.00	$3,100.00	0%	0
49-3011.00	Aircraft Mechanics and Service Technicians	73	3	210	$44,280.00	$2,720.00	-2%	2
51-8013.00	Power Plant Operators	73	3	480	$50,240.00	$8,680.00	10%	21
17-3027.00	Mechanical Engineering Technicians	72	3	130	$44,890.00	$3,330.00	2%	3
53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	72	3	60	$42,890.00	$1,330.00	5%	2

47-4021.00	Elevator Installers and Repairers	72	4	0	$50,960.00	$9,400.00	0%	0

Top Industries for Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Motor vehicle parts manufacturing	336300	12.90%	8,743	6,265	-28.35%
Machine shops	332710	12.37%	8,385	6,243	-25.55%
Turned product and screw, nut, and bolt manufacturing	332720	10.79%	7,314	4,771	-34.77%
Other fabricated metal product manufacturing	332900	8.65%	5,864	4,676	-20.26%
Other general purpose machinery manufacturing	333900	5.82%	3,942	3,202	-18.75%
Metalworking machinery manufacturing	333500	5.23%	3,541	2,609	-26.32%
Engine, turbine, and power transmission equipment manufacturing	333600	4.18%	2,831	2,138	-24.46%
Aerospace product and parts manufacturing	336400	4.01%	2,714	2,488	-8.34%
Agriculture, construction, and mining machinery manufacturing	333100	3.16%	2,143	1,801	-15.97%
Self-employed workers, primary job	000601	2.50%	1,695	1,625	-4.12%
Foundries	331500	2.15%	1,456	950	-34.74%
Forging and stamping	332100	2.02%	1,368	963	-29.57%
Iron and steel mills and ferroalloy manufacturing	331100	1.78%	1,209	733	-39.42%
Architectural and structural metals manufacturing	332300	1.60%	1,081	1,040	-3.88%
Medical equipment and supplies manufacturing	339100	1.54%	1,045	962	-7.94%

Top Industries for Machinists

Industry	NAICS	% in Industry	Employment	Projected Employment	% Change
Machine shops	332710	18.50%	73,341	63,702	-13.14%
Metalworking machinery manufacturing	333500	6.55%	25,986	22,339	-14.03%
Motor vehicle parts manufacturing	336300	6.18%	24,524	20,501	-16.40%
Employment services	561300	6.04%	23,956	31,835	32.89%
Aerospace product and parts manufacturing	336400	4.53%	17,976	19,223	6.94%
Other general purpose machinery manufacturing	333900	4.05%	16,052	15,215	-5.21%
Other fabricated metal product manufacturing	332900	3.34%	13,262	12,338	-6.96%

Turned product and screw, nut, and bolt manufacturing	332720	2.38%	9,427	7,174	-23.90%
Industrial machinery manufacturing	333200	2.04%	8,073	6,944	-13.98%
Navigational, measuring, electromedical, and control instruments manufacturing	334500	1.97%	7,831	7,872	0.53%
Plastics product manufacturing	326100	1.87%	7,414	8,252	11.30%
Engine, turbine, and power transmission equipment manufacturing	333600	1.70%	6,751	5,949	-11.87%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	1.55%	6,143	6,826	11.11%
Architectural and structural metals manufacturing	332300	1.55%	6,163	6,912	12.14%
Self-employed workers, primary job	000601	1.47%	5,836	6,528	11.86%

